

CHEMISTRY

Phone: (845) 257-3790

Location: Coykendall Science Building Room 105

Web address: www.newpaltz.edu/chemistry

The Department of Chemistry offers undergraduate liberal arts programs leading to Bachelor of Arts (BA) and Bachelor of Science (BS) degrees in Chemistry. Within these programs, students may choose from three concentrations:

- general chemistry
- American Chemical Society (ACS)-approved chemistry, and
- biochemistry emphasis.

The general chemistry and ACS-approved chemistry curricula share the same core courses that provide theoretical and hands-on education in the major areas of chemistry. Students are able to combine a general chemistry major with pre-law, business, or teaching programs. This concentration, with selected courses in biology, can prepare students for medical school entrance requirements. Preparation for a non-laboratory career in chemistry could include management or marketing courses offered by the Business program at New Paltz.

The American Chemical Society's Committee on Professional Training includes New Paltz's Department of Chemistry on its list of approved departments. This approval is equivalent to professional accreditation of the liberal arts curriculum. The ACS-approved curriculum builds on the general chemistry core and requires additional advanced courses. A student who obtains an ACS-approved degree is eligible for employment as a chemist in industry or government. The ACS-approved program also prepares students for graduate study and for professional training in medicine, dentistry, and veterinary medicine. Course offerings allow chemistry majors to obtain a broad background in several areas of chemistry.

The biochemistry emphasis is designed for the student interested in biochemistry or health-related sciences requiring a substantial background in chemistry. This program provides excellent preparation for health professional training, as well as for graduate study in clinical chemistry, physiology, and medicinal chemistry. Students take core courses in chemistry and biology and complete the year-long biochemistry sequence.

In addition to these major programs, a minor in Chemistry is available.

Prospective chemistry majors should consult with the department chair as soon as possible after admission to SUNY New Paltz and plan to take MAT251 Calculus I, CHE201 General Chemistry I and CHE211 General Chemistry I Lab in the fall semester of their freshman year.

The Departments of Chemistry and Biology also offer an interdisciplinary major in Biochemistry leading to a Bachelor of Science degree.

Minimum grade requirements:

- A minimum grade of C- is required to advance from CHE201 General Chemistry I to CHE202 General Chemistry II, from CHE202 General Chemistry II to CHE318 Organic Chemistry I, and from CHE318 Organic Chemistry I to CHE319 Organic Chemistry II.
- A minimum grade of C- in CHE319 Organic Chemistry II is required to enroll in BCM461 Biochemistry I.

- A minimum grade of C- is required to advance from BIO201 General Biology I to BIO202 General Biology II and from BIO202 General Biology II to BIO320 Genetics.
- A minimum grade of C- in MAT251 Calculus I is required to enroll in MAT252 Calculus II and in PHY201 General Physics I.

Chemistry (BA, BS) Program Learning Outcomes

Students who successfully complete a degree in Chemistry will be able to:

- Demonstrate a qualitative understanding of both atomic and molecular structure including shell structure, chemical bonding and the shapes of molecules.
- Understand trends in the periodic table, such as size and reactivity.
- Apply their knowledge of the concepts of quantitative chemical analysis and its relationship to experimental measurements and analyze the associated experimental error from each measurement.
- Derive mathematical relationships that are used to explain the chemical and physical processes of both macroscopic and molecular systems.
- Gain understanding of the chemical and physical properties of biomolecules.
- Extend and apply knowledge learned from courses in chemistry to areas outside the field.
- Demonstrate experience in chemistry research, having worked with a faculty mentor.
- Demonstrate experience in and knowledge of modern chemical instrumentation and laboratory techniques.
- Perform experiments following standard and more open-ended protocols.
- Search and interpret articles from scientific journals.
- Develop proficiency at writing scientific reports and/or delivering oral presentations based on experimental results and/or scientific subjects.
- Major in Chemistry (General Degree)
- Chemistry (ACS approved curriculum)
- Chemistry (Biochemistry Emphasis)
- Minor in Chemistry

CHE100. Environmental Chemistry. 3 Credits.

Principles of chemistry behind the effects of such environmental problems as acid rain, ozone layer depletion, atmospheric and aquatic pollution, global warming. Evaluation of experimental data leading scientists to current conclusions regarding these environmental issues.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE5: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration):
 - 7-12: Chemistry (032)
 - 7-12: Biology (031)
 - Adolescence Ed: Biology (031A)
 - Biology (101)
 - Chemistry (509)
 - Geology (510)
 - Physics (108)

Prerequisites:

- Math Placement Level Minimum Score of 3 or MAT 151 Minimum Grade of C- or MAT093 Minimum Grade of C- or MAT120 Minimum Grade of C- or MAT121 Minimum Grade of C-

May not be repeated for credit

CHE182. Chemistry in Art. 3 Credits.

Materials used in the production of art works, including their sources, properties, and applications. Topics to be covered are: metals, their use in sculpture, printmaking, and gold and silver work; paper; black and white photography; pigments and dyes; coatings (varnishes and synthetic polymers). Designed for non-science majors.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE5: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following field(s) of study (major, minor or concentration): Chemistry (509)

Prerequisites:

- Math Placement Level Minimum Score of 3 or MAT 151 Minimum Grade of C- or MAT093 Minimum Grade of C- or MAT120 Minimum Grade of C- or MAT121 Minimum Grade of C-

May not be repeated for credit

CHE191. Medicinal Chemistry. 3 Credits.

An exploration of the intersection between chemistry and medicine; covering some basic chemistry; the structure of the human body at various scales; and use of pharmaceuticals, including the chemical basis of how they interact with the body.

Attributes:

- Liberal Arts
- GE4: Natural Science Course
- GE5: Natural Science Course
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate

Prerequisites:

- Math Placement Level Minimum Score of 3 or MAT 151 Minimum Grade of C- or MAT053 Minimum Grade of C- or MAT120 Minimum Grade of C- or MAT121 Minimum Grade of C-

May not be repeated for credit

CHE193. Chemistry Selected Topic. 3-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate

May be repeated for credit

CHE199. Modular Course. 0 Credits.**Restrictions:**

- Must have the following level: Undergraduate

May not be repeated for credit

CHE201. General Chemistry I. 3 Credits.

Principles governing chemical change in relation to the atomicity of matter, atomic structure and the periodic system of the elements.

Attributes:

- Liberal Arts
- GE4: Natural Science Lecture
- GE5: Natural Science Lecture
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate

Prerequisites:

- Math Placement Level Minimum Score of 4 or MAT152 Minimum Grade of C- or MAT193 Minimum Grade of C- or MAT 153 Minimum Grade of C-
- CHE211 Minimum Grade of D*

* May be taken at the same time
May not be repeated for credit

CHE202. General Chemistry II. 3 Credits.

Kinetics, thermodynamics, equilibria and electrochemistry.

Attributes:

- Liberal Arts
- GE4: Natural Science Lecture
- GE5: Natural Science Lecture
- GE3: NSCI
- Systematic Inquiry

Restrictions:

- Must have the following level: Undergraduate

Prerequisites:

- CHE201 Minimum Grade of C-
- CHE211 Minimum Grade of D-
- CHE212 Minimum Grade of D-*
- Math Placement Level Minimum Score of 4 or MAT152 Minimum Grade of C-

* May be taken at the same time

May not be repeated for credit

CHE211. General Chemistry I Lab. 1 Credit.

Laboratory work complements the lecture material covered in CHE201.

Attributes:

- Liberal Arts
- GE4: Natural Science Lab
- GE5: Natural Science Lab

Restrictions:

- Must have the following level: Undergraduate

Corequisites:

- CHE201

May not be repeated for credit

CHE212. General Chemistry II Lab. 1 Credit.

Laboratory work complements the lecture material covered in CHE202.

THERE WILL BE AN ADDITIONAL FEE ASSOCIATED WITH THIS COURSE.

Attributes:

- Critical Thinking Introductory
- Critical Think Reason Intermed
- Information Literacy Intermed
- Information Mgmt Intro
- Liberal Arts
- GE4: Natural Science Lab
- GE5: Natural Science Lab

Prerequisites:

- Math Placement Level Minimum Score of 4 or MAT152 Minimum Grade of D-
- CHE201 Minimum Grade of D-

Corequisites:

- CHE202

May not be repeated for credit

CHE293. Chemistry Selected Topic. 3-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate

May be repeated for credit

CHE295. Indep Study Chemistry. 1-12 Credits.**Restrictions:**

- Must have the following level: Undergraduate

May be repeated for credit

CHE296. Departmental Elective. 0 Credits.**Restrictions:**

- Must have the following level: Undergraduate

May be repeated for credit

CHE299. Modular Course. 0 Credits.**Restrictions:**

- Must have the following level: Undergraduate

May be repeated for credit

CHE303. Introduction to Analytical Chemistry. 4 Credits.

Lecture and laboratory work in gravimetric, volumetric, and elementary instrumental analysis. Application of statistics to analytical chemistry.

Attributes:

- Information Literacy Intermed
- Information Mgmt Intrmd
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of D-

May not be repeated for credit

CHE306. Organic Chemistry I Lab. 1 Credit.

Laboratory meets once a week and will provide practical experience in some fundamental techniques of organic chemistry.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of C-

Corequisites:

- CHE318

May not be repeated for credit

CHE309. Organic Chemistry II Lab. 1 Credit.

Laboratory work will utilize the microscale techniques employed in Organic Chemistry I to the study of organic reactions. THERE WILL BE AN ADDITIONAL \$30.00 FEE ASSOCIATED WITH THIS COURSE.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of D-

Corequisites:

- CHE319

May not be repeated for credit

CHE314. Inorganic Chemistry. 3 Credits.

Inorganic Chemistry builds on the foundation provided in General and Organic Chemistry. The chemistry of the full periodic table will be discussed. Emphasis will be placed on modern techniques, theories, and applications.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of D-

May not be repeated for credit

CHE318. Organic Chemistry I. 3 Credits.

Structural theory and its application to the study of the properties of carbon compounds.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of C- and CHE212 Minimum Grade of D-
- CHE306 Minimum Grade of D-*

* May be taken at the same time

May not be repeated for credit

CHE319. Organic Chemistry II. 3 Credits.

Continuation of Organic Chemistry I.

Attributes:

- Critical Thinking Introductory
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE318 Minimum Grade of C- and CHE306 Minimum Grade of D-
- CHE309 Minimum Grade of D-*

* May be taken at the same time

May not be repeated for credit

CHE320. Physical Chemistry Recitation. 0 Credits.

Structured time each week for students to strengthen their problem-solving skills and understanding of concepts in physical chemistry by completing homework and other assignments given in CHE321 or 322 with support and guidance from the instructor.

Attributes:

- Liberal Arts

Restrictions:

- Must not be enrolled in the following class: Freshman
- Must be enrolled in the following field(s) of study (major, minor or concentration):
 - Adolescence Ed: Chemistry (441)
 - Chemistry (509)
 - Chemistry AP (50CH)

Prerequisites:

- CHE321* or CHE322*
- CHE202 Minimum Grade of C-
- PHY202 Minimum Grade of D-
- MAT341 Minimum Grade of D- or (MAT359 Minimum Grade of D- and MAT353 Minimum Grade of D-)

* May be taken at the same time

May be repeated for credit

CHE321. Physical Chemistry I. 3 Credits.

Study of ideal and real gases, kinetics, thermodynamics, phase and chemical equilibrium, electrochemistry.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of C-
- PHY202 Minimum Grade of D-
- (MAT341 Minimum Grade of D- or (MAT359 Minimum Grade of D- and MAT353 Minimum Grade of D-))

Corequisites:

- CHE320

May not be repeated for credit

CHE322. Physical Chemistry II. 3 Credits.

Introduction to quantum mechanics and atomic and molecular spectroscopy.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of C-
- PHY202 Minimum Grade of D-
- (MAT341 Minimum Grade of D- or (MAT353 Minimum Grade of D- and MAT359 Minimum Grade of D-))

Corequisites:

- CHE320

May not be repeated for credit

CHE323. Experimental Physical Chemistry. 3 Credits.

Lecture and laboratory work in methodology and techniques used in physical chemistry. Stresses design of experiments, thorough analysis of data, and the writing of scientific reports.

Attributes:

- Practicum - Non-Clinical
- Creative Works
- Critical Thinking Advanced
- Critical Think Reasoning Adv
- Information Literacy Advanced
- Information Mgmt Advanced
- Liberal Arts
- Writing Intensive

Restrictions:

- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE322 Minimum Grade of D-
- CHE321 Minimum Grade of D*

* May be taken at the same time

May not be repeated for credit

CHE393. Chemistry Selected Topic. 12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit

CHE396. Departmental Elective. 0 Credits.**Restrictions:**

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit

CHE399. Modular Course. 0 Credits.**Restrictions:**

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit

CHE407. Instrumental Techniques. 4 Credits.

Familiarization with the modern instruments and techniques used in chemistry.

Attributes:

- Practicum - Non-Clinical
- Creative Works
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE303 Minimum Grade of D-

May not be repeated for credit

CHE415. Advanced Inorganic Chem Lab. 1 Credit.

Inorganic Chemistry Laboratory puts into practice the principles learned in Inorganic Chemistry. Modern laboratory techniques will be taught and used to explore the chemistry of s, p, and d-block elements.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

Prerequisites:

- CHE202 Minimum Grade of D-
- CHE319 Minimum Grade of D-
- CHE314 Minimum Grade of D-*

* May be taken at the same time

May not be repeated for credit

CHE485. Seminars in Chemistry. 2 Credits.

A series of lecture and discussion sessions conducted by distinguished visiting scientists and faculty members and students of the chemistry department. Topics are of current interest in chemistry, many of which cannot be covered in traditional courses.

Attributes:

- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman
- Must be enrolled in the following field(s) of study (major, minor or concentration):
 - Adolescence Ed: Chemistry (441)
 - Chemistry (509)

May not be repeated for credit

CHE490. Senior Research in Chemistry. 3 Credits.

Student undertakes a program of research under the guidance of a faculty advisor.

Attributes:

- Creative Works
- Research
- Liberal Arts

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman
- Must be enrolled in the following field(s) of study (major, minor or concentration):
 - Adolescence Ed: Chemistry (441)
 - Chemistry (509)

May be repeated for credit

CHE493. Chemistry Selected Topic. 3-12 Credits.

Selected topics courses are regularly scheduled courses that focus on a particular topic of interest. Descriptions are printed in the Schedule of Classes each semester. Selected topics courses may be used as elective credit and may be repeated for credit, provided that the topic of the course changes.

Restrictions:

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman
- Must be enrolled in the following field(s) of study (major, minor or concentration):
 - Adolescence Ed: Chemistry (441)
 - Chemistry (509)

May be repeated for credit

CHE494. Fieldwork In Chemistry. 0 Credits.**Restrictions:**

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May not be repeated for credit

CHE495. Indep Study Chemistry. 1-12 Credits.**Restrictions:**

- Must have the following level: Undergraduate
- Must not be enrolled in the following class: Freshman

May be repeated for credit

Faculty**Dhar, Preeti**

Professor

Ph.D., Indian Institute of Technology, Kanpur

Office: CSB 318

Phone: (845) 257-3797

E-mail: dharp@newpaltz.edu

Ferguson, Megan

Associate Professor

Ph.D., California Institute of Technology

Office: CSB 217

Phone: (845) 257-6935

E-mail: fergusom@newpaltz.edu

Folmer-Andersen, Frantz

Associate Professor
Ph.D., University of Texas at Austin
Office: CSB 317
Phone: (845) 257-3796
E-mail: andersef@newpaltz.edu

Mentore, Gissel

Lecturer
Ph.D., Rensselaer Polytechnic Institute
Office: CSB 151
Phone: (845) 257-6961
E-mail: mentoreg@newpaltz.edu

Pilek, Matthew

Lecturer
M.A.T., SUNY New Paltz
Office: CSB 319B
Phone: (845) 257-3751
E-mail: pilekm@newpaltz.edu

St. John, Pamela

Professor and Chair
Ph.D., University of California, Los Angeles
Office: CSB 215
Phone: (845) 257-3794
E-mail: stjohnp@newpaltz.edu

Wilklow-Marnell, Miles

Assistant Professor
Ph.D., University of Rochester
Office: CSB 316
Phone: (845) 257-3779
E-mail: marnellm@newpaltz.edu